

will extend to the BTA boundary or the existing 35-mile protected circular area (from the incumbent), whichever is larger. The holder of the BTA authorization may assign or transfer control of its entire BTA, which will include all authorized stations, subject to the unjust enrichment provisions for designated entities. *See infra* at ¶¶ 183, 189. Such an assignment or transfer of an entire BTA may also include unserved areas so long as the five year build-out period has not expired. If a BTA authorization is assigned or transferred, the new holder of the BTA authorization is held to the original build-out period. The holder of the BTA authorization may also partition portions of the BTA along geopolitical boundaries under our partitioning rules, discussed below, and contract with eligible parties, allowing such parties to file long-form applications for the usable MDS channels within that area. We believe that allowing the partitioning of portions of the BTA service area will encourage provision of service to rural areas, which will promote the most efficient use of the spectrum. *See* 47 U.S.C. § 309(j)(3)(A) (instructing the Commission to promote the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas).

d. Partitioning

46. During the five year build-out period, we will permit the holder of a BTA authorization to partition portions of its BTA authorization and enter into contracts with eligible parties, allowing such parties to file long-form applications for the usable MDS channels within that partitioned area. The BTA may be partitioned along geopolitical boundaries, and the Commission may grant such applications, provided they are in compliance with the rules. Also, a holder of a BTA authorization will be permitted to add to its service area by acquiring a partitioned service area from the holder of an adjacent BTA. Following grant of such an application, the authorization will be referred to as "partitioned service area." The holder of a partitioned service area would, in effect, then hold something similar to a BTA authorization for the partitioned area. The protected service area will become or expand to the boundaries partitioned along the designated geopolitical boundaries and the same technical rules will apply, including the limiting signal strength at the boundaries of the partitioned area. Accordingly, the construction period for the partitioned service area will be the remaining portion of the five year build-out period and at the end of this five year period, the holder of the partitioned service area must demonstrate that it is providing substantial service to the partitioned area. Once construction is complete, the license term will run ten years from the date the Commission declared bidding in the MDS auction to be closed.

47. We agree with Rural Wireless that allowing holders of the BTA authorizations to partition will facilitate the provision of service to small markets and rural areas, some which currently have no source of multichannel video programming.⁴⁰ Partitioning will also

⁴⁰ Comments of Rural Wireless at 10; *See also* Reply Comments of Rural Wireless at 8; National Telephone Cooperative Association (Telephone Cooperative) at 3.

promote the most efficient use of the spectrum and encourage participation by a wide variety of entities, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women. See 47 U.S.C. §§ 309(j)(3)(B), (3)(D) and (4)(C).

e. Technical Rights and Responsibilities

48. In determining interference protection standards and other technical provisions under this new approach to MDS authorization of service, our objectives are two-fold: (1) to provide maximum flexibility to allow both new BTA authorization holders and current MDS licensees, conditional licensees, and applicants to develop and expand service in the most rapid and economically feasible manner, and (2) to assure that the introduction of new MDS service will not result in objectionable interference to the services of incumbent stations and will minimize in so far as possible the extent of potential interference within BTA service areas. These objectives and the provisions herein take into account the extent to which the current service has been built around successful negotiations among neighboring operators and/or licensees, as well as prospective operators and licensees. We fully expect this spirit of cooperation and accommodation to continue and, while we will adopt interference protection provisions for BTA and incumbent service, we will allow and indeed encourage the holders of BTA authorizations and incumbents to work out mutually agreeable interference concerns with other potentially affected parties whenever possible.

49. As a result of this *Report and Order* and a separate MDS order we are adopting today, protected service areas for BTA authorization holders and MDS incumbents will be defined differently. *Second Order on Reconsideration* at ¶¶ 2-31. We believe this approach will best facilitate the full development of incumbent wireless cable systems, many of which already have secured the desired transmitting site, and serve subscribers within a metropolitan area from a single site. In addition, this approach may allow the rapid expansion of new MDS service into other unserved portions of BTAs. We adopt an idea contemplated in the *Notice*, that the perimeter of a predetermined geographic area (BTA) generally defines its protected area. The holders of BTA authorizations will not be permitted to cause interference within the boundaries of an adjacent BTA, without the consent of the affected authorization holder. When such interference occurs, an offending party will be expected to act promptly to eliminate any unwanted interference in another operator's BTA.

50. Interference among adjacent BTA operators will be partially controlled by establishing an allowable limit for a station's predicted signal strength at all points along a BTA boundary. The same limiting signal strength will apply at the boundaries of every BTA, regardless of its size or shape. An exception to this limit would be justified where a single entity obtains authorization for adjacent BTAs. While we recognize that several commenting parties are concerned that an MDS signal simply does not stop at the area boundary, we believe the level of limiting signal strength given below, together with the multitude of available interference abatement techniques, will facilitate control of interference between BTA authorization holders in adjoining BTAs. Interference levels to BTA holders from MDS incumbent stations will be partially governed by establishing the same maximum

allowable signal strength along the boundary of incumbents' 35-mile circular areas, the expanded area provided in the *Second Order on Reconsideration*.

51. At first glance, it would appear that the approach to interference control between adjacent BTAs would be ineffective, given that the levels of desired (D) and undesired (U) could be the same at the common boundary between BTAs. The resulting desired-to-undesired signal strength ratio (D/U) of 0 dB falls well below the 45 dB standard now governing interference between MDS stations operating on the same channel. However, taking the signal suppressing affects of receiving antennas into account and further assuming that the desired and undesired signals are coming from opposite sides of the BTA boundary, the D/U ratio improves to as much as 25 dB. If we further expect that in most cases, stations on opposite sides of the boundary would operate with different antenna polarizations, then the D/U ratio further improves to 45 dB. These numbers are based on the characteristics of the standard MDS receiving antenna found in 47 C.F.R. § 21.902(f). Alternatively, station operators on opposite sides of a BTA boundary may design their facilities with agreements between affected parties to operate on a frequency offset basis, with a less restrictive D/U ratio of 28 dB necessary to prevent cochannel interference in this situation. Indeed, a host of interference abatement techniques could be employed to prevent interference near BTA boundaries. Admittedly, this approach relies more on operator interference agreements and the honoring of another's interference rights than it does on applying rigid interference standards in the processing of applications. However, if we were to mandate strict compliance with the 45 dB cochannel and 0 dB adjacent channel D/U signal strength ratios (the current MDS interference standards) to protect BTA service at the BTA boundary, we believe there would be populated areas within a substantial number of BTAs that may never be served due to the irregular sizes and shapes of BTAs. Moreover, as we have indicated, given the nature and history of the service, as well as the likelihood that auction participants will be experienced in conducting negotiations, we believe that we can prevent unwanted interference by relying primarily on negotiated agreements and voluntary compliance with our interference right-of-ways, which we will enforce as necessary. Thus, we consider our limitation of signal strength at the BTA boundaries and incumbent service areas as a secondary means of interference protection.

52. Inasmuch as incumbent stations lie within BTAs and authorized BTA stations will not have their own protected service areas, interference from incumbent stations can only be governed by agreements between affected parties, and indirectly, by placing a limiting value on the strength of the signal at the boundary of incumbent MDS stations. A signal strength, regardless of its numerical value, will not by itself eliminate the potential for interference from incumbent stations. Terrain shielding, and other abatement techniques will also be helpful in this regard; however, the most effective means of controlling interference will be the agreements between BTA authorization holders and incumbent MDS licensees, which for example, may stipulate that an incumbent utilize a directional antenna pointed away from the affected BTA.

53. We have selected as the limiting signal strength a power flux density value of -73 dBw/m^2 . This value corresponds to a received power level of approximately -83 dBw (decibels above 1 watt) or -53 dBm (decibels above 1 milliwatt), given a receiver antenna with a maximum gain of 20 dBi . A power flux density value is used because "free space" propagation is the model long used in the MDS service. This variable depends only on the level of power radiated from a transmitting antenna and the distance between the transmitting and receiving locations. The value of -73 dBw/m^2 was selected because it is the "free space" value of power flux density achieved with an equivalent isotropically radiated power (EIRP) of 2,000 watts (the maximum allowable EIRP in the MDS service where omnidirectional antennas are used) at a distance separation of 35 miles. This numerical value is stronger than the power flux density achieved under standards used in the MDS service for many years, *i.e.*, a value of -75.6 dBw/m^2 is achieved with 200 watts of EIRP at a distance of 15 miles. Moreover, based on the record in the *Second Order on Reconsideration*, it is clear that many wireless cable systems serve a substantial subscriber base at distances of 35 miles or even greater. Thus, we conclude that the selection of this value of limiting signal strength will generally enable service over unobstructed signal propagation paths at the 35-mile boundary of an incumbent's transmitting facilities. The ability to achieve this signal level at a BTA boundary will vary considerably, depending on the size of the BTA and the placement of a transmitting facility. Clearly, because of their large size, service of many BTAs will require multiple transmitting facilities.

54. In the *Notice* we stated our intention not to change the interference protection standards applied "at points along the service contours of protected facilities." *Notice* at 7674. Accordingly, BTA authorization holders will be required to design their transmitting facilities to protect points along the 35-mile circles and points within the protected service areas of incumbents' licensed stations, conditionally licensed stations, or previously proposed applications. Specifically, stations proposed in BTA long-form applications must meet the 45 dB and 0 dB cochannel and adjacent channel desired-to-undesired signal strength ratios at the boundary of each protected 35-mile circle. We will also continue to use these stricter protection standards within incumbents' protected service areas. Unlike BTA service, which does not yet exist, incumbent stations have an established subscriber base in many cities and rural areas throughout the country. Wireless cable systems were carefully crafted, both through engineering design, site location and negotiation among affected parties, and in partial reliance on the Commission's protection standards. To a considerable extent, these systems provide interference-free reception to subscribers, many out to distances beyond 35 miles. Because many wireless cable systems have been serving subscribers well beyond their current 710 square mile protected service area, we do not wish to disrupt existing service patterns which compete with wired cable systems.

55. The holders of BTA authorizations within 80 kilometers (50 miles) of the Canadian or Mexican borders, may only operate on MDS channels pursuant to the restrictions in international agreements. Thus, applicants considering authorizations for these BTAs should consider the impact of the additional border requirements in their valuation of the service areas for competitive bidding purposes.

3. Treatment of Incumbents

56. As we have stated, a principal objective in this proceeding is to allow incumbents to continue existing operations without objectionable interference from new MDS operations and to allow them sufficient flexibility to modify their facilities to respond to market forces. Expansion of the protected service boundary to 35 miles will increase an incumbents' service area from 710 square miles to 3848 square miles, which will allow for the future orderly development of wireless cable systems, particularly as digital technology is introduced. *Second Order on Reconsideration* at ¶¶ 2-31.

57. Incumbents, unless they also control the adjacent BTA territory (either as BTA authorization holders or through interference agreements) will not be free to expand further their service area into the adjacent BTA. The manner we choose to prevent such occurrences is to define a limiting power flux density of -73 dBw/m^2 , which may not be exceeded at points along the 35-mile protected service area. Subject only to this limitation, incumbents will be free to file long-form applications at any time to modify their facilities or add facilities such as signal boosters. In a small number of cases involving directional antennas, an incumbent's power flux density may already exceed -73 dBw/m^2 , for signal paths in some directions at a distance of 35 miles. In such cases, we would not force the incumbent to reduce the signal strength to the allowable limit, nor would we allow the signal level to increase. Incumbents who propose to modify their stations must continue to seek prior Commission approval pursuant to 47 C.F.R. §§ 21.40 through 21.42, and include any agreements with the holder(s) of a BTA authorization(s). All other current rules continue to apply to MDS incumbents unless specifically amended.

58. Finally, since the incumbents' 35-mile protected circles will be embedded within one or more BTAs, to prevent additional encroachment into a BTA we must at some point fix the 35-mile circles around a permanent reference point, absent an interference agreement with a BTA authorization holder. Accordingly, on the effective date of the rules adopted in the *Second Order on Reconsideration*, we will permanently fix the location of the protected 35-mile circles in the following manner. For incumbent licensees with no conditional licenses or pending applications, the "protected reference coordinates" will be those of the current site. Subsequent changes in site location would be permitted; however, the 35-mile circle would remain centered about the previous site coordinates. For incumbents having only a conditional license or a new station application pending before the effective date, the site coordinates specified for the conditional license or pending application will become the reference coordinates. In cases where an incumbent has two or more authorizations and/or pending applications on the effective date, the reference coordinates in each authorization and/or application will be provisionally treated as the permanent reference coordinates of the protected circle. Eventually, pending applications will be disposed of and conditional licenses will either become licenses or be forfeited for failure to construct.

4. Alternative Uses of MDS Frequencies

59. The principal use of MDS frequencies is wireless cable service. Under Section 21.903(a) of the Commission's rules, 47 C.F.R. § 21.903(a), MDS stations are "generally intended to provide one-way radio transmission (usually in an omnidirectional pattern) from a stationary transmitter to multiple receiving facilities located at fixed points." At the same time, our rules permit use of MDS frequencies for other kinds of services. Section 21.903(b), 47 C.F.R. § 21.903(b), states that "[u]nless otherwise directed or conditioned in the applicable instrument of authorization, Multipoint Distribution Service stations may render any kind of communications service consistent with the Commission's rules on a common carrier or on a non-common carrier basis" We wish to emphasize that nothing in this *Report and Order* precludes either new licensees or incumbents from using MDS frequencies for other kinds of services pursuant to 47 C.F.R. § 21.903(b). We note, however, that such applicants may need to apply for waivers of certain MDS technical rules, such as 47 C.F.R. §§ 21.903(a) and 21.906.

B. INTERFERENCE CRITERIA AND DATA ELEMENTS

60. **Proposals.** As a complement to the filing proposals and electronic procedures, the *Notice* proposed to adopt a technical equation as the basis for the "free space" interference protection calculations. The Commission's MDS engineers currently utilize this formula and it is recognized by engineering consulting firms in the wireless cable industry:

The received signal power level $(RSL)_{dBW}$ at the output of the FCC reference receiving antenna is obtained from the following: ⁴¹

$$(RSL)_{dBW} = (EIRP)_{dBW} - (L_{FS})_{dB} + (G_{AR})_{dB}$$

where the free space loss $(L_{FS})_{dB}$ is

$$(L_{FS})_{dB} = 20 \log (4\pi d/\lambda) \text{ dB}$$

In these equations, $(RSL)_{dBW}$ is received power in decibels referenced to one watt, $(EIRP)_{dBW}$ is equivalent isotropically radiated power in decibels above one watt, d is the distance of the signal path in meters, λ is the wavelength of the signal in meters, and G_{AR} is the gain of the reference receiving antenna, as obtained in 47 C.F.R. § 21.902(f)(3), Figure 1. The *Notice* proposed to formalize the above equations by adopting them as a rule provision as part of a plan to implement computerized interference studies. Additionally, the *Notice* stated that we will require proposed facilities to meet the 45 dB and 0 dB cochannel and adjacent channel

⁴¹ Leon W. Couch II, *Digital and Analog Communication Systems*, p. 384 (3rd ed. 1990).

desired-to-undesired signal strength ratios at points along the service contours of protected facilities which were authorized under the current interference standards. With regard to long-form applications, we proposed to retain the requirement in 47 C.F.R. § 21.902, that an applicant perform analyses of the potential for harmful interference and serve such interference studies upon the authorized or previously proposed station applicants, conditional licensees or licensees required to be studied, but we would not require the submission of a list of those served at the time the long-form application was filed. We explained that, on the revised long-form application form, the applicant would supply certain crucial data elements describing the station parameters, such as antenna polarization and the station EIRP, while the Commission staff would perform interference analyses using a computer program. The *Notice* stated that, although the submission of interference or other engineering analyses would not be required with the long-form application, we would require the applicant to make the records available for Commission inspection upon request. We also questioned in the *Notice* whether we should eliminate signal contour maps as a required part of the interference studies.

61. Pursuant to our streamlining effort, the *Notice* proposed to improve the current application form used for new MDS stations, FCC Form 494,⁴² by excluding certain data elements which have yielded information that is no longer necessary or of only marginal utility. Specifically, we proposed to eliminate queries regarding the antenna vertical sketch and the narrative description of why grant of the application would be in the public interest. We further proposed to exclude the following parameters of the transmission system: transmitter manufacturer and model number, transmitter output power, transmitting antenna gain and the specification of transmission line and other transmission losses. We observed that with regard to transmitters, we are only concerned that MDS licensees operate transmitters that are "type-accepted" by the Commission for use in this service. Accordingly, we proposed to eliminate the requirement that the applicant identify the transmitter make and model, and simply require that the conditional licensee certify that its transmitter is "type-accepted" in its certification of completion of construction, currently FCC Form 494A. The MDS rules now provide for a maximum EIRP, rather than a maximum value for transmitter output power. See 47 C.F.R. § 21.904. Thus, the *Notice* stated, so long as the EIRP remains within the limits of Section 21.904, it is not necessary to require applicants to specify the equipment parameters used to calculate EIRP. The *Notice* also proposed to allow changes to these transmission parameters without notification to the Commission, provided the resulting EIRP would not change. The station power to be specified on the application form would be the maximum EIRP in the horizontal plane, *i.e.*, the EIRP at an angle of zero degrees in the vertical plane. We proposed to permit electrical beam tilting of antennas; however, in all cases, applicants would be required to specify the EIRP in the zero degree vertical (horizontal) plane. Where beam tilting is employed, the EIRP at the zero degree vertical angle will be less than the maximum EIRP at the tilt angle,

⁴² Since Form 494 is a multi-purpose form that is used for other services, to the extent that we are proposing changes, we intend to create a different form to be used for MDS.

due to the vertical suppression characteristic of the transmitting antenna. In most instances, this value of EIRP closely approximates the power radiated to the radio horizon which is most relevant to interference analysis. By proceeding in this manner, we would not need to collect data on antenna vertical radiation patterns.

62. The *Notice* proposed to further modify the long-form application in an effort to make the form compatible with an electronic filing system. At the present time, we propose to use a new long-form application together with the current FCC Form 430, the Licensee Qualification Report. An appendix to the *Notice* listed data elements and other informational items for our proposed new electronic application form, including general, engineering and legal elements. For example, we proposed to retain engineering data elements necessary for analysis of interference or possible air safety hazards, such as transmitting antenna site coordinates, EIRP, antenna polarization, site elevation and antenna structure height above ground. Other data would be used to verify an applicant's compliance with a particular Commission rule, such as when antenna beam width is used to calculate the maximum allowable EIRP of a station using a directional transmitting antenna. We also proposed to retain applicant responses which demonstrate compliance with a particular statutory requirement, such as an environmental assessment.

63. In reference to applicants locating stations in areas where notification or coordination with Canada or Mexico is required by international agreement, the *Notice* indicated that these applicants would be required to submit the following additional technical data, which were not proposed as standard data elements in the electronic long-form application: transmitter output power, transmitting antenna gain and transmission line loss. In addition to the EIRP at a vertical angle of zero degrees, applicants in the border areas will be required to specify the maximum EIRP at the vertical angle corresponding to the beam tilt. The *Notice* explained that the additional data requirements could be submitted in a textual exhibit to the electronic application or a paper supplement.

64. *Comments.* Several commenters support use of the proposed interference protection calculations and use of a computer-assisted interference program.⁴³ Vega suggests that the Commission make the program available to all users. The Association generally supports the formula but is concerned that the proposal to require proposed facilities to demonstrate compliance with the 45 dB and 0 dB D/U ratios only at points along the protected service area contour could prove problematic when terrain shielding protects the contour of the protected service area, but not internal points.⁴⁴ To avoid this problem, the Association recommends, the Commission should mandate that when terrain shielding is

⁴³ See, e.g., Comments of Hardin at 11; Mitchell at 3; Vega at 10; Association at 50; ACS Enterprises, *et al.* at 15.

⁴⁴ The Commission may waive its interference protection rules when it is apparent that the signal is blocked by a substantial terrain obstruction, referred to as terrain shielding.

relied upon to demonstrate interference protection at the boundary, an analysis be conducted of the potential for interference along the given radial at the point farthest from the desired station that is not terrain shielded, if any. Hardin supports use of the formula and points out, however, that the *Notice* fails to address frequency offset and terrain shielding.

65. Dalager, Hammett & Edison, Inc. (Hammett) and Marshall state that the proposed interference protection calculations are too simplistic and thus inadequate because they fail to consider terrain shielding, frequency offset or cross polarization. Comments of Dalager at 3; Hammett at 1-2; Marshall at 8. Hammett further explains that use of EIRP in the horizontal plane ignores beam tilt, concluding that many completely sound designs would be rejected if this approach is used. Marshall suggests that the free space propagation formula be combined with the equation for desired-to-undesired signal strength ratio.

66. Five parties discuss the submission of maps with the engineering proposal in the long-form application. Dalager recommends that the Commission examine adjacent channel MDS stations only as far as 25 miles away, rather than 100, and cochannel stations only far enough out that a signal reaches their protected area, rather than a mandatory 100 miles. Hardin agrees with Marshall's contention that there is no need for 100-mile maps of adjacent channel stations and suggests that investigating potential for adjacent channel interference within 50 miles should be sufficient.⁴⁵ Mitchell asserts that signal contour maps, while not a requirement, should be encouraged to prove interference free operation because they will enhance the acceptability for new applications. Vega agrees with Commission's proposal to modify 47 C.F.R. § 21.902(c)(2) and eliminate the map requirement. Hardin requests that we standardize the methodology used to demonstrate terrain shielding, suggesting the use of shadow maps as the most efficient method.

67. The Association states that the list of proposed data elements and other informational items for our proposed new electronic application form, including general, engineering and legal elements, appear to be appropriate. We received several specific comments in response to our proposal to exclude certain data elements which have yielded information that is no longer necessary or of only marginal utility. Caritas agrees with the *Notice*, that transmitter power ratings should no longer be required, but Hammett contends that the Commission should not eliminate the requirement that applicants specify the parameters used to calculate EIRP. Comments of Caritas at 3; Hammett at 2. Hammett believes that the Commission needs the details on how EIRP was calculated because it is important to allow others to check the accuracy of claimed EIRP values. Similarly, Vega recommends that the Commission retain the antenna vertical profile sketch because it plays an important role in the attributes of mounting configurations of a particular MDS facility in relationship to other services utilizing the structure and gives general identification of the type of structure, which can be particularly helpful under situations such as elaborate

⁴⁵ This issue is the subject of a petition of reconsideration of *Report and Order*, PR Docket 92-80, 8 FCC Rcd 1444 (1993).

structure mounting configurations like the Empire State Building. Vega believes that the long-form application should retain the questions on detailed technical information, such as transmitter type, transmission line loss and/or antenna gain including antenna manufacturer and model number, currently requested on Form 494. Caritas agrees with the Commission's proposal to retain the notification requirement of cochannel and adjacent channel licensees and permittees, and further recommends that applicants maintain application summaries and make them available to entities with sites within a 75-mile radius upon request.

68. Some commenters suggested that we eliminate specific requirements. Many commenters request elimination of the requirement under 47 C.F.R. § 21.902(i)(3), to serve, by certified mail, a copy of the interference analysis on ITFS licensees or permittees, and one of those parties requests that we revise Section 21.902(c) to eliminate the requirement to file interference studies for previously proposed MDS stations which at one time had been informally classified as a lottery loser. Crowell & Moring and CAI Wireless argue that a licensee should be permitted to establish transmitter sites anywhere within the boundaries of its service area or modify its facilities without prior approval from the Commission, so long as the licensee subsequently files the technical details and certifies that the modification complies with the interference protection requirements. Comments of Crowell & Moring 8-9; CAI Wireless at 8. CAI Wireless also suggests that the Commission end its regulation of beam benders, multiple transmitter systems and other engineering solutions which expand service quickly to underserved areas.

69. **Resolution.** With some additional clarification, we will adopt the proposals raised in the *Notice*, including the free space equation and the proposed data elements for the long-form application. A draft long-form application, FCC Form 304, is attached as Appendix D.⁴⁶ We will develop computer programs that will help to streamline the processing of the long-form and modification applications of MDS incumbents and BTA authorization holders. A program is being designed that will perform cochannel and adjacent channel interference analysis at one degree intervals along the protected 35-mile circle of incumbents' authorized stations or protected station proposals. This program, as envisioned, will use the Commission's three-second terrain data base to check for unobstructed signal paths between the site of the station being studied and points along the incumbent's protected contour. For those radials on which line-of-sight conditions do not exist, either due to a terrain obstruction or the earth's curvature, the program will conclude that interference would not occur at that point. We note, following long-standing Commission practice, that all line-of-sight determinations will assume a receiver height of 30 feet and a standard 4/3 earth radius for determining the electrical horizon. Where line-of-sight conditions exist, the program would first determine the proposed station's EIRP in the pertinent direction, based on the EIRP and horizontal relative field strength tabulation given in the application. The

⁴⁶ The Office of Management and Budget has not yet approved the FCC Form 304 pursuant to the Paperwork Reduction Act. A public notice will be issued when the new form has been approved and is available for use.

received signal power level of the proposed station, the "undesired signal" (U), will then be calculated using the free space equation. The value of the receiver antenna gain in this calculation will depend on the angular relationship between the radial azimuth and the orientation of the receiving antenna. We will assume that the latter is pointed toward the station being received. The gain will also depend on whether the proposed station is cross polarized or co-polarized with respect to the protected station. The receiving antenna gain will be that of the reference receiving antenna found in Section 21.902(f)(3), Figure 1 of the Commission's rules. We here establish a fixed value for the "desired signal" level at the 35-mile boundary. Assuming a receiver antenna gain of 20 dB above an isotropic antenna, an EIRP of 2000 watts (33 dBw) and a frequency of 2638 MHz, the midpoint frequency between channels E1 and H3, the free space propagation equation gives a value of - 82.9 dBw. Our computer program will therefore use a received power level ("D") of - 83 dBw as the value of the desired signal strength. Finally, the program will compute the value of the desired-to-undesired signal strength ratio ("D/U"), which in logarithmic units is expressed as D - U. This value will be tested against the minimum standard of 45 dB.

70. Another program is being designed that will analyze the impact of incumbents' modification applications. This program will analyze 360 radials spaced by one degree, first checking for unobstructed line-of-sight paths to the 35-mile boundary and, for clear paths, calculating the free space signal strength that would result from the modification and comparing it to the maximum allowable limit; that is, a power flux density value of - 73 dBw/m². To the extent that we are not constrained by licensing agreements with third parties and to the extent resources are available, we will make our computer programs available to the public. This will be announced in a subsequent public notice.

71. We emphasize that we will use computer models as application processing tools. Similar processing tools have been successfully used for Low Power Television Service with very few reported cases of interference to television reception, none of which occurred inside of a station's protected contour. The MDS interference standards should not be confused with the processing methods, which can only approximate the standard. For example, under the interference standards, incumbents' 35-mile areas are to be protected not only at points along the boundary, but also within the boundary.

72. Although, as applicable, we will require MDS applicants to prepare interference analyses or notification of application filings, and serve these on potentially affected parties, we will generally not require that such studies or a list of the parties served be included with applications. However, since electronic filing will be implemented in this service on a voluntary basis, we will allow applicants to submit interference studies with their applications on a voluntary basis. Applicants may also submit negotiated agreements of tailored interference protection or operation on the basis of frequency offset. Applicants may submit terrain shielding studies based on methods of their own choosing, including shadow maps. There are no universally accepted methods for terrain shielding studies given the widely varying characteristics of terrain features. Therefore, we believe it is appropriate to afford applicants the flexibility to select a terrain model suitable to the terrain being analyzed.

Additionally, we are persuaded by the comments that interference studies should no longer be required to include contour maps. As Marshall points out, contour lines can be used in several ways and are most useful when drawn on a terrain shadow map, which is not a required element in the application process. Applicants may continue to prepare interference studies with D/U contour lines at their discretion. Given the structure and processing tools associated with our new licensing approach for the MDS service, we will not prescribe how applicants' interference studies are to be conducted. Further, potentially affected parties who are served a study and disagree with its conclusions may file a petition to deny an application.

73. As contemplated in our *Notice*, we intended to streamline our application forms in accordance with our actions herein. We are, therefore, directing the staff to incorporate as appropriate those data elements previously listed in the *Notice* into a revised and reformatted long-form application for use in the future by MDS applicants seeking to construct new stations or to make changes in their authorized facilities.

C. ELECTRONIC FILING AND ELECTRONIC FEE PAYMENTS

74. *Proposals.* In the *Notice* we invited comment on the feasibility of utilizing mandatory electronic filing for new MDS applications, on whether ITFS applicants should be required to file applications for new stations electronically on a combined application form,⁴⁷ and on whether there should be a paper exception for those educators that are not financially supported by a wireless cable operator. *Notice* at 7676-77. The *Notice* suggested that communication links could be used to exchange application data between applicants and the Commission, thus minimizing the filing of paper with the Commission and allowing the Commission to process MDS and ITFS applications more efficiently. Pursuant to the proposal, an electronic form would be designed for personal computers using a Windows based environment, and consisting of a series of computer screens. One possible approach identified in the *Notice* involves the use of electronic mailboxes such as that of a Value Added Network (VAN). Applicants would transmit relevant data from their personal computer to a VAN electronic mailbox. The VAN would, in turn, convert the data into a format compatible with Commission files and download the information to an electronic mailbox at the Commission. In the *Notice*, we recognized the possible limitations of this approach with respect to maps and other graphic representations. We envisioned that the public would have on-line viewing access to our data bases, perhaps through a third-party vendor in addition to access at the Commission's public reference room.

⁴⁷ In 1992, Congress amended the Communications Act of 1934 to permit the electronic filing of license and construction permit applications. See Telecommunications Authorization Act of 1992, Pub. L. No. 102-538, § 204, 106 Stat. 3533, 3543, codified at 47 U.S.C. §§ 308(b) and 319(a). Such applications may be signed "in any manner or form, including by electronic means, as the Commission may prescribe by regulation." *Id.*

75. In the *Notice*, we also proposed expanding the acceptable methods of payment for application fees to include electronic payment under 47 C.F.R. § 1.1109.⁴⁸ We stated our intention of announcing the procedures for the electronic payment of fees in a public notice, pursuant to Section 1.1109(a)(1). We sought comment regarding a fee system where applicants use a unique fee payor number together with an appropriate service code and a suffix in cases where applicants file multiple applications, in order to link the fee payment with the electronically filed application.

76. *Comments.* The majority of commenters support the Commission's initiative to implement electronic filing and agree that access by the public to the data base would facilitate more accurate and up-to-date information concerning filings with the Commission. Commenters are split on whether electronic filing should be mandatory or voluntary. In addition, many commenters believe that the Commission should adopt a hybrid approach to electronic filing, permitting paper filing of graphic representations and maps. A number of commenters express concern regarding what software and access method would be used, stressing that the Commission should implement a solution that is user-friendly and able to accommodate multiple operating environments. A few commenters express concern about data security and system reliability. We received no objections to electronic fee payment. Specific comments are discussed below.

77. Commenters who support an electronic filing approach have differing views on whether electronic filing should be mandatory or voluntary.⁴⁹ The Association's position is that electronic filing should be mandatory, noting that the costs of electronic filing are small compared to the costs of constructing and operating MDS or ITFS stations. Furthermore, the Association asserts that the entire electronic filing system would be compromised if some or all ITFS licensees were exempted, because the data base would then no longer be complete or definitive. ITFS Parties share this view. However, ITFS Parties suggest that the Commission consider permitting, for a short transition period, applicants who filed paper copies to refile their applications electronically within thirty days of Commission notification if they certify that they were unaware of the electronic filing mandate. Further, ITFS Parties suggest that the Commission not require that all ITFS filings be electronically filed (*e.g.*,

⁴⁸ The Commission recently amended 47 C.F.R. §§ 1.1108 and 1.1109 to permit the electronic filing of fee payments, initially on an experimental basis. *Implementation of Section 9 of the Communications Act, Report and Order* in MD Docket No. 94-19, FCC No. 94-140 (released June 8, 1994), 59 Fed. Reg. 30,984 (June 16, 1994) at ¶¶ 50-51.

⁴⁹ See, *e.g.*, Comments of Association at 47; and ITFS Parties at 2 (calling for mandatory electronic filing). ITFS Parties includes South Carolina Educational Television Commission, State of Wisconsin-Educational Communications Board and University of Maine System. See, *e.g.*, Comments of Rural Wireless at 12-13; Caritas at 4; National ITFS at 4; Pepper & Corazzini, L.L.P. (Pepper) at 8; and Multi-Micro at 2 (calling for voluntary electronic filing).

certifications of completion of construction, assignments and transfers).

78. Conversely, several commenters propose voluntary electronic filing, claiming that smaller applicants might not have access to the technologies necessary for completion and submission of applications via electronic filing, and that an immediate and mandatory conversion to an electronic filing system could undermine the goals of the proposal, in part due to technical questions and applicant confusion. For instance, Caritas claims that mandatory electronic filing would unfairly advantage larger educational institutions which have familiarity with, and access to, electronic networks. Similarly, National ITFS believes that mandatory electronic filing would place an unusual and onerous burden on educators whose application is not supported by an excess capacity lessee, and who may never apply for more than four channels. Pepper believes that the Commission should organize a committee to recommend Commission-wide electronic filing standards and procedures for all services. A few commenters express reservations about electronic filing and whether it would increase processing efficiency. *See, e.g.*, Comments of Marshall at 10-12; Vega at 14-15. Vega proposes that if the Commission implements electronic filing at all, it should proceed slowly in making a transition from paper to electronic filing.

79. Dalager and ITFS Parties agree with the Commission's observation in its *Notice* that electronic filing could be problematic in terms of feasibility and cost, with respect to graphic representations and maps. *See* Comments of Dalager at 3; ITFS Parties at 3. Dalager and ITFS Parties therefore propose that the Commission consider a hybrid system using both paper and electronic filing.

80. A number of commenters provide suggestions and recommendations regarding the type of software to be used and access methodology for electronic filing.⁵⁰ Essentially, commenters stress the need to carefully consider alternative approaches, access methodology, compatibility issues, ease of use and associated expense. For example, ITFS Parties propose that the use of the Internet, rather than a VAN for electronic filing may be a viable option, due to wide access to the Internet, and claim that use of a VAN would simply add to the applicants cost of filing. Marshall claims that generally, engineering software used for MDS saves graphical information (such as shadow maps and radio path studies) in standard Hewlett Packard Graphics Language (HPGL) format, and suggests that whatever standard is used for electronic filing be compatible with HPGL. Hardin also holds the view that whatever standard is used, it should be compatible with HPGL. Pepper proposes that whatever software is used, it should be readily available, inexpensive, able to accommodate multiple platforms and it should be easy to access with standard communication software and protocols.

81. Pepper is concerned about computer security, including the authentication of the

⁵⁰ *See, e.g.*, Comments of ITFS Parties at 3-5; Marshall at 11-12; Pepper at 3-6; Reply Comments of Hardin at 6.

filing parties, and stresses the need for protection of confidential data. Vega is concerned about the security of the transfer protocol. A number of commenters, including Caritas, ITFS Parties and Pepper, note that a process should be put in place which enables applicants to ascertain what information was received by the Commission and on what date. These applicants express a need for an immediate and documentable confirmation of receipt, such as that which currently exists with date stamping. Pepper also stresses the need for selecting a reliable network capable of handling large volumes and having a reliable back-up system.

82. We received no objections to electronic fee payments. Vega expresses support for the Commission's adoption of a method of accepting electronic payments, assuming that other current forms of payment remain an option. Comments of Vega at 15; *See* Comments of Association at 50. Other commenters declined to address electronic fee payments.

83. **Resolution.** We will authorize voluntary electronic filing for new MDS applications. Use of an electronic filing system is not as essential under the filing approach we adopt today because we anticipate that fewer long-form applications will be filed. We also considered the burden on educators and determined that applications for new ITFS stations will not be included at this time. We appreciate the concerns expressed by commenters, including the cost to applicants of implementing and using electronic filing, data security and system reliability issues. We will take these concerns into account in deciding upon the software which will be used and the access method for electronic filing. We agree with commenters who encourage the Commission to evaluate carefully alternative electronic filing approaches and who suggest a transition period from paper filing to electronic filing. At the present time, we decline to accept the proposal put forth by Pepper regarding the establishment of a committee to recommend Commission-wide standards and procedures for all services, noting that the merits associated with the formation of such a committee would be outweighed by factors such as delayed decision making and implementation of electronic filing. Through subsequent public notices we will provide specific details concerning the method for electronically filing MDS applications. We will also authorize electronic fee payment for MDS applications. Current methods of payment available under 47 C.F.R. § 1.1109 will continue to be accepted. As our resources permit, we will work toward improved viewing access to the data bases.

D. COMPETITIVE BIDDING PROCEDURES

1. Competitive Bidding Background

84. On August 10, 1993, the Omnibus Budget Reconciliation Act of 1993 (Budget Act) added a new section 309(j) to the Communications Act of 1934, as amended, 47 U.S.C. §§ 151-611 (Communications Act). This amendment to the Communications Act gave the Commission express authority to employ competitive bidding procedures to choose from among mutually exclusive applications for certain initial licenses. The Commission adopted a *Notice of Proposed Rule Making* in the competitive bidding proceeding on September 23,

1993.⁵¹ In its March 8, 1994 *Second Report and Order*,⁵² the Commission established general rules and procedures and a broad menu of competitive bidding methods to be used for all auctionable services, including MDS. We indicated in the *Second Report and Order* that in subsequent Reports and Orders we would set forth specific competitive bidding rules that would be applicable to individual services. To date, the Commission has established competitive bidding rules specifically applicable to, and has conducted auctions for, narrowband Personal Communications Services (PCS),⁵³ the Interactive Video and Data Service (IVDS),⁵⁴ and broadband PCS.⁵⁵ This *Report and Order* establishes competitive bidding rules and procedures for MDS.

85. Given the interdependencies we believe exist between authorizations for certain BTA service areas and the declining cost of conducting simultaneous multiple round bidding, we choose this auction method for use in MDS. We also adapt the general procedures set forth in the *Second Report and Order* so as to be compatible with the application procedures established for MDS in this *Report and Order*. Finally, we set forth rules to deter possible abuses of the bidding and application procedures, and establish special provisions for small businesses, including those owned by minorities and women, to encourage their participation in the competitive bidding process and in the provision of MDS system offerings.

2. Auction Eligibility

86. The Commission has in the past employed a random selection process (*i.e.*, a lottery) to select from among mutually exclusive MDS initial applications. See 47 C.F.R. § 1.824. However, Section 309(j) of the Communications Act, as amended, permits auctions where (1) mutually exclusive applications for initial licenses or construction permits are

⁵¹ *Notice of Proposed Rule Making* in PP Docket No. 93-253, 8 FCC Rcd 7635 (1993) (*Competitive Bidding Notice*).

⁵² *Second Report and Order* in PP Docket No. 93-253, 9 FCC Rcd 2348 (1994) (*Second Report and Order*), *recon. granted in part*, *Second Memorandum Opinion and Order*, 9 FCC Rcd 7245 (1994) (*Second Memorandum Opinion and Order*).

⁵³ *Third Report and Order* in PP Docket No. 93-253, 9 FCC Rcd 2941 (1994) (*Third Report and Order*), *recon. granted in part*, *Third Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 10 FCC Rcd 175 (1995) (*Third Memorandum Opinion and Order*).

⁵⁴ *Fourth Report and Order* in PP Docket No. 93-253, 9 FCC Rcd 2330 (1994) (*Fourth Report and Order*), *petition for recon. pending*.

⁵⁵ *Fifth Report and Order* in PP Docket No. 93-253, 9 FCC Rcd 5532 (1994) (*Fifth Report and Order*), *recon. granted in part*, *Fifth Memorandum Opinion and Order*, 10 FCC Rcd 403 (1995) (*Fifth Memorandum Opinion and Order*).

accepted for filing by the Commission; (2) the principal use of the spectrum will involve or is reasonably likely to involve the receipt by the licensee of compensation from subscribers in return for enabling those subscribers to receive or transmit communications signals; and (3) the objectives set forth in Section 309(j) would be promoted. In the *Second Report and Order*, we concluded that single and multichannel MDS as classes of services would satisfy the Section 309(j) criteria for auctionability, and, thus, new initial applications in MDS would be eligible for competitive bidding. *Id.* at 2359. The *Second Report and Order* did not, however, expressly resolve the question of the auctionability of mutually exclusive MDS station applications filed prior to July 26, 1993, the date specified in the Commission's auction authority in the 1993 Budget Act. *Id.* For the reasons set forth in Section 3 below, we now determine to lottery these previously filed MDS applications.

3. Disposition of Previously Filed MDS Applications

87. Before the Commission conducts competitive bidding for the BTA service areas applied for under the revised procedures set forth herein, we must first process the remaining acceptable, mutually exclusive applications for MDS station licenses that were filed prior to July 26, 1993.⁵⁶ Under the procedures in effect prior to the enactment of competitive bidding authority in the 1993 Budget Act, these mutually exclusive MDS applications were to have been lotteried. In September 1993, the Commission tentatively concluded to lottery rather than auction pre-July 26, 1993 MDS applications. *See Competitive Bidding Notice* at 7661. In reaching this decision, the Commission first noted that these applications had already incurred substantial delays. The Commission then tentatively decided to eschew auctions in favor of lotteries for pending MDS applications to avoid "further delay" in granting MDS station licenses and providing service to the public during the time it would take for the Commission to promulgate competitive bidding rules. *Id.*⁵⁷ Subsequently, in the *Second Report and Order*, the Commission concluded that new initial applications in MDS would be eligible for competitive bidding, but did not resolve the question of whether to employ lotteries or auctions to dispose of the previously filed MDS applications. *Second Report and Order* at 2359. Thus, due to processing delays and further delays resulting from the consideration of issues raised in the Budget Act regarding competitive bidding, this group of previously filed MDS applications, through no fault of the applicants themselves, has never been lotteried.

⁵⁶ Once we complete our processing, we expect that this group of previously filed, acceptable MDS station applications will likely be quite small, consisting of approximately 100 mutually exclusive applications for five rural locations. The applications for these five locations have been pending since 1991.

⁵⁷ We note that commenters supported the Commission's tentative conclusion to lottery previously filed MDS applications. *See, e.g.,* Comments of JAP Telecom Systems, Inc. at 7 and Comments of MW TV, Inc. at 2-3, filed in response to *Competitive Bidding Notice*.

88. The 1993 Budget Act empowers the Commission to either auction or lottery these previously filed MDS applications.⁵⁸ Consistent with the statute, our tentative conclusion in the *Competitive Bidding Notice*, and Commission precedent,⁵⁹ we now exercise our discretion to lottery this group of remaining previously filed, mutually exclusive MDS applications. By employing lotteries for pre-July 26, 1993 MDS applications, and by holding auctions for initial applications accepted for filing after that date, we adopt a straightforward approach that is easy to apply, fair to the applicants and serves the public interest.

89. As previously noted by the Commission, the Budget Act's legislative history reflects Congress' recognition that equitable considerations and administrative costs may justify the use of lotteries for those applicants who, in reliance on the existing lottery procedures, had filed applications prior to July 26, 1993. *See Cellular Unserved Order* at 7391. In examining the equities and administrative costs at stake here, and based on the record before us, we believe that the public interest would be served by using a lottery to dispose of the relatively few remaining previously filed MDS applications for the handful of locations at issue. Indeed, we believe this situation presents facts that are precisely the type that warranted the grant of discretion to the Commission on this point. Specifically, with regard to equitable considerations, we note that most of these MDS applications on file have been pending for over four years due to the aforementioned processing delays, which were not the fault of the applicants.⁶⁰ Particularly given this lengthy delay, we believe it would be unfair to require these previously filed applicants to refile their applications and participate in an auction for BTA service areas, as they submitted their applications with the expectation of participating in a lottery for a site-specific conditional station license. Our decision will ensure that these pending applications will be processed under the rules in effect at the time the applications were filed. It will also result in similar treatment for MDS applications filed within the same general time period. Those few applications that remain pending due to administrative delay will be processed in a manner similar to other MDS applicants that filed prior to July 26, 1993, but were able to have their applications processed and conditional station licenses granted under the lottery procedures then in effect.⁶¹

⁵⁸ *See* 47 U.S.C. §§ 309(i) & (j); Budget Act, Pub. L. No. 103-66, § 6002(e) (Special Rule), 107 Stat. 312, 397 (1993).

⁵⁹ *See Memorandum Opinion and Order* in PP Docket No. 93-253, 9 FCC Rcd 7387 (1994) (*Cellular Unserved Order*) (determining to lottery previously filed applications for cellular unserved areas).

⁶⁰ This four year period that these previously filed MDS applications have been pending is considerably longer than the one year period that the cellular unserved applications had been on file before the Commission determined to lottery those applications.

⁶¹ Likewise, the winning applicants for the small number of lotteries held pursuant to this decision will receive the benefits of the expanded protected service area definition for site-specific stations that we adopt today in a companion item. *See Second Order on*

90. Moreover, if the Commission were to require the previously filed MDS applicants to participate in an auction, it would be necessary to allow the applicants to submit the information required by the competitive bidding rules set forth herein. In contrast, a lottery would require no further submissions by the applicants, and could be conducted almost immediately, unlike an auction, which likely could not be held until the end of this year. Furthermore, in fairness to the previously filed applicants, those who indicate no desire to participate in an auction may be entitled to a refund of their application fees. Given the expected low commercial value of the MDS channels in the small number of rural locations at issue here,⁶² we feel that these administrative costs associated with conducting an auction for the approximately 100 previously filed applications would not be justified. *See Cellular Unserved Order* at 7391-7392. In summary, we believe that it would be inequitable and administratively burdensome to require applicants for MDS station licenses, who filed their applications over four years ago in reliance upon the lottery procedures then in effect, to participate in an MDS auction.

91. We also believe that any concern that many of these previously filed MDS applications at issue were prepared and filed by the same entities on behalf of the individual applicants "does not, by itself, justify the use of auctions in these circumstances." *Id.* at 7391. There is no evidence before us that these individual applicants, if awarded an MDS conditional station license by lottery, would not construct and operate an MDS station. These applicants did expend the time and the funds required to have their MDS station applications prepared and filed, and we have no evidence, on the record before us, to conclude that they will fail to construct an MDS station and provide service to the public. *See, e.g.,* Comments of MW TV, Inc. filed in response to *Competitive Bidding Notice* at 2 (stating that it would be "terribly inequitable" to force MW TV into a "bidding process to secure [MDS] authorizations for which it has already expended a substantial amount of funds").⁶³

Reconsideration. Thus, the approximately five lottery winners of site-specific conditional station licenses will be afforded treatment similar to other applicants who filed applications for site-specific MDS licenses prior to July 26, 1993, but who managed to avoid administrative delay and to have their applications processed and conditional licenses granted.

⁶² As we note in our discussion of the treatment of designated entities (*see infra* Section 7), for various reasons unique to MDS we anticipate that the BTA service areas will be auctioned for relatively modest amounts under our prospective licensing regime. It seems reasonable to assume that the small number of rural, site-specific MDS conditional station licenses at issue here would draw even less money at auction than the relatively modest amounts we anticipate for the larger geographic areas that will be auctioned in the future.

⁶³ We emphasize that the MDS station applicants prevailing in a lottery will be subject to a one year build-out requirement. *See* 47 C.F.R. § 21.43 (requiring completion of construction of MDS stations within twelve months from date of conditional station license

92. Moreover, dismissal of these previously filed applications without prejudice to participate in a future BTA auction -- on the basis of a theory that the service for which the applicants previously applied either has changed significantly or no longer exists -- presents several potential drawbacks. Significantly, dismissal of these pending applications likely would engender reconsideration proceedings at the Commission and legal challenges in the courts. Such administrative and judicial delays could further postpone granting MDS licenses and providing service to the public, contrary to the public interest. In addition, while we are changing the conditions under which MDS service may be provided in the future, such as moving to larger geographic area authorizations and expanded service area protection, we are not fundamentally changing the nature of the service. Licensees still will be providing wireless cable service to subscribers, albeit under altered conditions designed to make the service more competitive with cable television. Therefore, on the basis of this record, and considering the equitable and administrative factors identified above, we conclude, as we did in the *Cellular Unserved Order*, that the use of a lottery, rather than competitive bidding, to award MDS conditional station licenses to the remaining previously filed applicants would best serve the public interest.

93. We also conclude that our balancing of the equitable and administrative factors identified above to determine whether a lottery or an auction of the previously filed MDS applications best serves the public interest is consistent with the specific terms of the 1993 Budget Act and existing relevant case law. We note that the factors set forth in Section 309(j)(3) pertaining to competitive bidding methodologies do not specifically govern the decision as to how to treat these previously filed MDS applications. The Section 309(j)(3) factors are incorporated into Section 309(j)(2) as part of the determination of whether a service "may" be auctioned. 47 U.S.C. § 309(j)(2) & (3). There is no doubt that we have the authority under the statute to use auctions to dispose of these previously filed applications for MDS station licenses, if using auctions satisfies the Section 309(j)(3) factors. Rather, the question before us here is not whether we *may* utilize an auction, but whether we *should*. For that determination, the relevant provision of law is Section 6002(e) of the Budget Act.

94. Section 6002(e), entitled "Special Rule," made an exception to the general requirement that, if a service met the standards for auctionability under Section 309(j)(2), the Commission could not use a lottery to award licenses for such service. Under the Section 6002(e) Special Rule, the Commission may use a lottery to award licenses even for an otherwise auctionable service for certain previously filed applications. In adopting this provision, Congress indicated that the exception would "permit" the Commission to use lotteries for certain IVDS and "several other licenses." H.R. Conf. Rep. No. 213, 103d Cong., 1st Sess. 498 (1993). Thus, even if the factors set forth in Section 309(j)(3) are met with regard to auctions, our discretion under the Section 6002(e) Special Rule to choose lotteries for other reasons is not diminished.

grant).

95. Congress did not, however, establish any standards for the exercise of the Commission's discretion under the Special Rule. As set forth in the *Cellular Unserved Order*, we continue to believe the proper approach is to balance the advantages and disadvantages of lotteries and auctions to determine which best serves the public interest on the facts before us. This approach is consistent with judicial precedent, which indicates that in determining whether to apply new rules to pending applicants, the Commission should balance the "ill effect" of the new rule on the pending applicants with the "mischief of frustrating the interests the rule promotes." *Maxcell Telecom Plus, Inc. v. FCC*, 815 F.2d 1551, 1554 (D.C. Cir. 1987). In certain circumstances, as in *Maxcell*, which involved switching from comparative hearings to lotteries in the cellular radio service, the benefits in broadly applying the Commission's new rules outweigh the harms to previously filed applicants. In the situation before us, however, as in the *Cellular Unserved Order*, we conclude, for the reasons discussed above, that the "ill effects" on the applicants that previously filed applications substantially outweigh any potential "mischief" that may be caused to the development of MDS in the small number of rural markets likely at issue. Accordingly, we conclude that the use of lotteries for these few pending applications best serves the public interest.

4. Competitive Bidding Design

96. In this *Report and Order*, we have attempted to design auction rules and procedures that are compatible with the unique characteristics of MDS and that meet the congressional objectives set forth in the Communications Act. See 47 U.S.C. § 309(j)(3). We believe that these objectives are embodied in two basic Commission policy goals: promoting economic growth and enhancing access to telecommunications service offerings for consumers, producers and new entrants. *Second Report and Order* at 2349-2350. In the paragraphs below, we implement competitive bidding for MDS, pursuant to Section 309(j) of the Communications Act and based on the record in this proceeding.⁶⁴ The methodology and

⁶⁴ Very few comments were filed in response to the *Competitive Bidding Notice* addressing either the applicability of competitive bidding to mutually exclusive MDS initial applications or the auction method to be employed for MDS. MW TV, Inc. and JMP Telecom Systems, Inc. commented solely on whether to apply competitive bidding rules to pending MDS applications. The Association was the only commenter to address the issue of MDS auction design.

In the *Notice*, the Commission invited further comment concerning MDS competitive bidding procedures. Of the twenty-two sets of comments submitted in response to this *Notice* and listed in Appendix A, comments relating to competitive bidding in particular were submitted by American Telecasting, CAI Wireless, ACS Enterprises, *et al.*, Dalager, Heartland, Mitchell, PacTel, Vega, Rural Wireless, U.S. Wireless and Association. Only eight commenters addressed MDS auction design specifically (American Telecasting, CAI Wireless, ACS Enterprises, *et al.*, Heartland, Mitchell, PacTel, Vega and Association). Reply comments addressing competitive bidding issues were submitted by American

procedures we will utilize in conducting MDS auctions are identified below, and additional details about specific competitive bidding procedures will be provided by public notice prior to the MDS auction.

a. General Competitive Bidding Designs

97. The *Second Report and Order* established the criteria to be considered in selecting the auction methodology for each auctionable service. We generally concluded that awarding licenses to those parties that value them most highly will best advance congressional policy goals. *Id.* at 2360. We also indicated that, because a bidder's ability to introduce valuable new services and to deploy them rapidly, intensively and efficiently increases the value of the license to that bidder, an auction design that awards licenses to those bidders who are willing to pay the highest bid tends to promote the development and deployment of new services and the efficient and intensive use of the spectrum. *Id.* at 2349-2350.

98. With regard to auction methodologies specifically, the Commission previously determined that: (1) licenses with strong interdependencies should be auctioned simultaneously;⁶⁵ (2) multiple round auctions, by providing bidders with information regarding other bidders' valuations of licenses, generally will yield more efficient allocations of licenses and higher revenues, especially where there is substantial uncertainty as to value; and (3) because they are relatively expensive to implement and time-consuming, simultaneous and/or multiple round auctions become less cost-effective as the value of licenses decreases. *Second Report and Order* at 2360. We also found that simultaneous multiple round bidding facilitates the efficient aggregation of licenses across spectrum bands and geographic areas, and, because of the superior information and flexibility this bidding methodology provides, is likely to yield greater revenues than other auction designs. Thus, we concluded in the *Second Report and Order* that the use of simultaneous multiple round bidding would generally be preferred. *Id.* at 2366.

99. We also recognized in the *Second Report and Order* that simultaneous multiple round bidding may appear more complex to bidders and could be more difficult and expensive to implement than other auction methods. *Id.* at 2364. We have, however, in the past year gained considerable experience in conducting simultaneous multiple round bidding. This competitive bidding method has been utilized in several narrowband and broadband PCS

Telecasting, ACS Enterprises, *et al.*, Telephone Cooperative, Rural Wireless, CAI Wireless and Association.

⁶⁵ Licenses are interdependent when the value of a license to the bidder depends on the other licenses that the bidder acquires. *Second Report and Order* at 2361. Licenses may be interdependent because they are substitutes or because they are complements. *Id.* at 2364.

auctions,⁶⁶ and has proved to be an efficient and effective way to conduct spectrum auctions. In addition, the cost to the Commission of conducting simultaneous multiple round bidding has decreased considerably since the initial simultaneous auctions because the computer software used in these auctions has now been developed. We have also recently initiated procedures permitting remote bidding from personal computers throughout the country. Consequently, bidders may now participate in simultaneous multiple round auctions in a variety of ways -- on site, by personal computer using remote bidding software, or via telephone.

b. MDS Competitive Bidding Design

100. Given our growing and successful experience with this auction design, we conclude that the generally favored method of simultaneous multiple round bidding is appropriate for MDS. We accordingly adopt this method to auction the BTA service areas.

101. In the *Notice*, we had tentatively concluded that simultaneous multiple round bidding was less appropriate for MDS than other auction methods primarily because the "value of and interdependence between" the geographic service areas might not be "sufficiently high to justify the use" of the generally preferred auction method. *Notice* at 7678. After further consideration, and based upon our continuing successful experience with simultaneous multiple round bidding, we now conclude that simultaneous multiple round bidding is in fact appropriate for MDS.

102. With regard to the expected value of the BTA service areas at auction, we realize that some areas -- particularly those with sparse populations -- may be auctioned for relatively modest amounts.⁶⁷ The value of any BTA service area at auction will, however, vary, depending in large part upon the population of and the amount of usable spectrum in that area.⁶⁸ Heavily populated BTA service areas may therefore attract more substantial

⁶⁶ The Commission has also recently proposed to utilize simultaneous multiple round bidding for both the 800 and 900 MHz Specialized Mobile Radio services. *Further Notice of Proposed Rule Making* in PR Docket No. 93-144 and PP Docket No. 93-253, FCC 94-271 (released Nov. 4, 1994); *Second Report and Order and Second Further Notice of Proposed Rulemaking* in PR Docket No. 89-553, PP Docket No. 93-253, and GN Docket No. 93-252, FCC 95-159 (released April 17, 1995).

⁶⁷ See, e.g., Comments of Vega at 18; Association at 43; American Telecasting at 5-7; ACS Enterprises, *et al.* at 17 (asserting that MDS channels are low valued).

⁶⁸ See Comments of CAI Wireless at 9 (population of the relevant area, availability of ITFS and MDS channels, and bidder company business strategies "will substantially impact the valuation of 'area licenses'"). Wireless cable valuations, whether of companies, systems or channels, have generally been done on a population basis. See, e.g., Gerard Klauer

sums, depending on the availability of spectrum within such areas. *See* Comments of PacTel at 3 (noting that "areas with the largest populations should be of significant value"). Given the substantially decreased costs associated with implementing simultaneous multiple round bidding, we believe that BTA service area values are sufficient to justify the use of this auction method. We must consequently disagree with the commenters who state that simultaneous multiple round bidding is inappropriate for MDS because this auction method is overly expensive, particularly when compared to an open outcry method, and administratively complex for the Commission. *See* Comments of ACS Enterprises, *et al.* at 17-19; Vega at 18. *See also* Comments of Association at 43-44 (supporting use of open outcry method on grounds of cost and complexity, if national filing window approach is adopted).⁶⁹

103. With regard to the question of interdependence, we believe that the BTA service area authorizations to be auctioned possess a degree of interdependence. As explained in the *Notice*, "[t]here appears to be some geographic interdependence due to coordination of interference at the borders." *Id.* at 7678. Indeed, because we have selected a filing approach based on predetermined geographic areas, rather than a national filing window, we emphasize that authorizations for adjacent BTA service areas will be interdependent, as common ownership of such areas will reduce problems of controlling interference at the borders of the BTAs. *See Second Report and Order* at 2364; *See also* Comments of Association at 37 (adjacent geographic markets may be interdependent). Interdependence between the BTA authorizations may also arise from economies of scale achieved by wireless cable operators spreading of fixed costs over more units of output. *See Second Report and Order* at 2364; *See also* Comments of PacTel at 3 (there may be interdependencies "due to the desire to achieve significant economies of scale"). We accordingly conclude that there is some degree of interdependence between BTA authorizations and that this interdependence may be significant for geographically contiguous BTAs. *See* Comments of PacTel at 3 (noting "some significant interdependence" between "contiguous markets"). Thus, the

Mattison & Co., Inc., *The Wireless Cable Industry: Summary of 1994 and Outlook for 1995* (Dec. 22, 1994) at 3; Singer, *Wireless Values: Wall Street Eyes Management and Spectrum, Private Cable and Wireless Cable* (Nov. 1994) at 21; Paul Kagan Associates, Inc., *Wireless Cable Investor* (Nov. 30, 1994) at 7.

⁶⁹ Other commenters, while not explicitly asserting that simultaneous multiple round bidding is overly complex and expensive for the Commission, nonetheless support the use of oral bidding for MDS on the grounds that an open outcry auction would be simple and economic (*see* Comments of CAI Wireless at 9) or efficient (*see* Comments of Heartland at 9-10; American Telecasting at 25). We do not dispute that oral bidding can be a cost-effective and efficient method of auctioning spectrum. However, we believe that, for the reasons described above, simultaneous multiple round bidding will be more cost effective and efficient for MDS than oral bidding, particularly given the interdependencies that exist between authorizations for adjacent BTA service areas.

adoption of simultaneous multiple round bidding should result in the most efficient award of these BTA authorizations. *See Second Report and Order* at 2363. In particular, we believe that potential bidders that operate (or are planning to operate) MDS systems in geographically adjacent BTAs and/or in several regions of the country will be able to make more informed bidding decisions in a simultaneous auction where all BTA service areas may be bid upon at the same time. *See Comments of Association* at 37 (if Commission selects filing approach based on defined geographic areas, Commission should "permit simultaneous multi-round bidding . . . that permits an applicant to bid for licenses for adjacent geographic markets that may be interdependent.").

104. We must, given the sources noted above from which interdependence may arise, disagree with those commenters who indicate that there is little or no interdependence between MDS channels and who oppose simultaneous multiple round bidding on that basis. *See Comments of American Telecasting* at 26; *Heartland* at 8-9; *Vega* at 17. Indeed, we note that some commenters acknowledge that their opposition to simultaneous bidding is based, not on firm evidence that BTA authorizations lack interdependence, but rather on their preference for a national filing window approach to MDS licensing.⁷⁰ However, because we are adopting a filing approach based on predetermined geographic areas, the authorizations for adjacent BTA service areas will, as discussed above, be interdependent. *See Comments of Association* at 37; *PacTel* at 3. While it may be difficult to determine the exact degree of interdependence between the BTA authorizations to be auctioned, as evidenced by the disagreement among the commenters,⁷¹ we believe, for the reasons stated previously, that there is some interdependence between them and that simultaneous multiple round bidding will allow bidders to best take account of such interdependencies. Because the Commission has gained substantial experience with simultaneous bidding, which has declined significantly in cost, we conclude that simultaneous multiple round bidding is appropriate for MDS, as this bidding method will most efficiently award authorizations for those service areas (particularly contiguous BTAs) which are interdependent. *See Second Report and Order* at 2363-2364.

105. In addition to issues of cost and interdependence, other considerations support the use of simultaneous multiple round bidding for MDS. Compared with other bidding mechanisms, including open outcry and sealed bidding, simultaneous multiple round bidding

⁷⁰ *See Comments of Vega* at 17 (since we support national filing window, an interdependence issue is virtually eliminated); *Association* at 43 (under national filing window approach, simultaneous multiple round auctions are unnecessary since there will be little interdependence between different licenses).

⁷¹ *See, e.g., Comments of PacTel* at 3 ("there may be some significant interdependence . . . in contiguous markets"); *Comments of CAI Wireless* at 9 ("interdependence between geographical areas . . . will vary widely"); *Comments of ACS Enterprises, et al.* at 18 ("MDS channels to be auctioned would not have a high degree of interdependence").